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EXAMINER	
LEE, ANDREW CHUNG CHEUNG	

ART UNIT	PAPER NUMBER
2616	

DATE MAILED: 06/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/080,509	PIIRAINEN, OLLI	
	Examiner	Art Unit	
	Andrew C. Lee	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 2, 3, 4, 9, 10, 11, 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "considerable" in claims 1, 2, 3, 4, 9, 10, 11, 12 is a relative term which renders the claim indefinite. The term "considerable" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Regarding claim 1, page 16, lines 15 – 16, 19 – 20, the claimed subject matter "if the difference between the measured signal strengths is considerable"; regarding claim 2, page 16, lines 12 – 13, the claimed subject matter "if the difference between the measured signal strengths is considerable"; regarding claim 3, page 17, lines 12 – 13, the claimed subject matter "if the difference between the measured signal strengths is considerable"; Regarding claim 9, page 18, lines 11 – 12, 15 – 16, the claimed subject matter "if the difference between the measured signal strengths is considerable"; regarding claim 10, page 18, lines 12 – 13, the claimed subject matter "if the difference between the measured signal strengths is considerable"; regarding claim 11, page 19, lines 7 – 9, the claimed subject matter "if the difference between the measured signal strengths is considerable";

Regarding claims 4, and 12, the terms "considerable', and "determined threshold value" are not defined by the claim, the specification does not provide explicitly a standard for

ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 2, 3, 9, 10, 11, 4, 12, 5, 13, 7, 15, 8, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miya et al. (US 6721367 B1) and Moulsley (US 6470006 B1) in further view of Nakamura et al (US 6442218 B1).

Regarding claims 1, 2, 3, 9, 10, 11, Miya et al. disclose the limitation of a method and means for improving the quality of data transmission in cellular radio systems utilizing time division multiple access (recited "TDMA system, it is desirable to suppress multi-path propagation by transmitting signals to either path A or path B, each signal is transmitted using a separate slot" as improving the quality of data transmission in cellular radio systems utilizing time division multiple access; Fig. 15, column 12, lines 1 – 6), comprising: measuring the strength of the signal the base station receives in at least two consecutive time slots (recited "the two weighting factors of path A and path B are selected and transmission with directivities for both paths is performed . Path A is output with time slot 1 and path B is output with time slot 2" as measuring the strength of the signal the base station receives in at least two consecutive time slots; column 12, lines 20 – 25), determining a first weighting coefficient by comparing the strength of

the signal the base station receives in a time slot with the strength of the signal the base station receives in a previous time slot (recited "calculate the power of the correlator output and detect times t0 and t1" as determining a first weighting coefficient; column 8, lines 50 – 54), determining a second weighting coefficient by comparing the strength of the signal the base station receives in a time slot with the strength of the signal the base station receives in a following time slot (column 9, lines 1 – 8), Miya et al. do not disclose explicitly reducing by means of the first determined weighting coefficient in soft bit decision-making the significance of at least one symbol at the beginning of the burst the base station receives in a time slot if the difference between the measured signal strengths is considerable, reducing by means of the second determined weighting coefficient in soft bit decision-making the significance of at least-one symbol at the end of the burst the base station receives in a time slot if the difference between the measured signal strengths is considerable. Moulsley discloses the limitation of reducing by means of the first determined weighting coefficient in soft bit decision-making the significance of at least one symbol at the beginning of the burst the base station receives in a time slot if the difference between the measured signal strengths is considerable (recited "the measurement around the start of the time slot may be in the preceding time slot, column 2, lines 31 – 34, and "the measurement may comprise bit error or signal quality at the start and the end of time slot, to measure the corruption of bits" as reducing at least one symbol at the beginning of the burst the base station receives in a time slot if the difference between the measured signal strengths is considerable; column 2, lines 31 – 46), reducing by means of the second determined weighting coefficient in soft bit decision-making the significance of at least-one symbol at the end of the burst the base station receives in a time slot if the difference between the measured signal strengths is considerable (recited "the

measurement around the end of the time slot may be in the succeeding time slot, column 2, lines 32 – 34, and "the measurement may comprise bit error or signal quality at the start and the end of time slot, to measure the corruption of bits" as reducing at least one symbol at the end of the burst the base station receives in a time slot if the difference between the measured signal strengths is considerable; column 2, lines 31 – 46). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miya et al. to include reducing by means of the first determined weighting coefficient in soft bit decision-making the significance of at least one symbol at the beginning of the burst the base station receives in a time slot if the difference between the measured signal strengths is considerable, reducing by means of the second determined weighting coefficient in soft bit decision-making the significance of at least-one symbol at the end of the burst the base station receives in a time slot if the difference between the measured signal strengths is considerable. such as that taught by Moulsley in order to a method of controlling the timing of a transmission time slot within a time frame, a channel being allocated to the time slot for transmission from a transmitting station to a receiving station (as suggested by Moulsley, see column 1, lines 66 – 67, column 2, lines 1 – 3). Both Miya et al. and Moulsley teach in which the strength of a signal received at a base station is measured (Miya et al, recited "selects a weighting factor based on the reception quality" as the strength of a signal received at a base station is measured, column 9, lines 21 – 23; Moulsley, recited "measuring the received signal power", column 4, lines 66 – 67). However, both Miya et al. and Moulsley fail to disclose a decoder for soft decision-making is employed. Nakamura et al. disclose explicitly the limitation of a decoder for soft decision-making is employed (recited "include a soft-decision unit for carrying out a soft decision" as a decoder for soft decision-making is employed; Fig. 2,

element 2-3a, column 6, line 67, column 7, lines 1 – 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Both Miya et al. and Moulsley to include a decoder for soft decision-making is employed such as that taught by Nakamura et al. in order to provide a demodulator which can improve a transmission-line estimate by using tentatively decided data symbols as pilot symbols, and, at the same time, avoids degradation in accuracy of the transmission-line estimate when error rate of the tentatively decided data symbols grows large (as suggested by Nakamura et al., see column 3, lines 21 – 26).

Regarding claims 4, 12, Miya et al. disclose the limitation of a method and means as claimed in claimed wherein the difference in signal strengths is considerable if it exceeds a determined threshold value (recited "a desired wave or SIR reaches a maximum value" as difference in signal strengths is considerable if it exceeds a determined threshold value; column 8, lines 56 – 62).

Regarding claims 5, 13, Miya et al. disclose the limitation of a method and means for improving the quality of data transmission in cellular radio systems utilizing time division multiple access (recited "TDMA system, it is desirable to suppress multi-path propagation by transmitting signals to either path A or path B, each signal is transmitted using a separate slot" as improving the quality of data transmission in cellular radio systems utilizing time division multiple access; Fig. 15, column 12, lines 1 – 6). Miya et al. do not disclose explicitly a method and means as claimed in claimed wherein the weighting coefficients are higher than 0 but lower

than 1. Nakamura et al. disclose the limitation of a method and means as claimed in claimed wherein the weighting coefficients are higher than 0 but lower than 1 (recited "the tentatively decided data is larger than the predetermined value (e.g. 0.5), the weight W_2 is set to a relatively large value" as the weighting coefficients are higher than 0 but lower than 1; column 12, lines 60 – 69). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miya et al. to include a method and means as claimed in claimed wherein the weighting coefficients are higher than 0 but lower than 1such as that taught by Nakamura et al. in order to provide a demodulator which can improve a transmission-line estimate by using tentatively decided data symbols as pilot symbols, and, at the same time, avoids degradation in accuracy of the transmission-line estimate when error rate of the tentatively decided data symbols grows large (as suggested by Nakamura et al., see column 3, lines 21 – 26).

Regarding claims 7,15, Miya et al. disclose the limitation of a method and means for improving the quality of data transmission in cellular radio systems utilizing time division multiple access (recited "TDMA system, it is desirable to suppress multi-path propagation by transmitting signals to either path A or path B, each signal is transmitted using a separate slot" as improving the quality of data transmission in cellular radio systems utilizing time division multiple access; Fig. 15, column 12, lines 1 – 6). Miya et al. do not disclose explicitly a method and means as claimed in claimed wherein the weighting coefficients have the same values for all symbols to be weighted in each time slot. Nakamura et al. disclose the limitation of a method and means as claimed in claimed wherein the weighting coefficients have the same values for all symbols to be weighted in each time slot (recited "the first weight-coefficient-multiplication unit

has a fixed weight (e.g. 1 as in this example)" as the weighting coefficients have the same values for all symbols to be weighted in each time slot; column 12, lines 24 – 25). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miya et al. to include a method and means as claimed in claimed wherein the weighting coefficients have the same values for all symbols to be weighted in each time slot such as that taught by Nakamura et al. in order to provide a demodulator which can improve a transmission-line estimate by using tentatively decided data symbols as pilot symbols, and, at the same time, avoids degradation in accuracy of the transmission-line estimate when error rate of the tentatively decided data symbols grows large (as suggested by Nakamura et al., see column 3, lines 21 – 26).

Regarding claims 8, 16, Miya et al. disclose the limitation of a method and means for improving the quality of data transmission in cellular radio systems utilizing time division multiple access (recited "TDMA system, it is desirable to suppress multi-path propagation by transmitting signals to either path A or path B, each signal is transmitted using a separate slot" as improving the quality of data transmission in cellular radio systems utilizing time division multiple access; Fig. 15, column 12, lines 1 – 6). Miya et al. do not disclose explicitly a method and means as claimed in claimed wherein the weighting coefficients have different values for different symbols to be weighted in each time slot. Nakamura et al. disclose the limitation of a method and means as claimed in claimed wherein the weighting coefficients have different values for different symbols to be weighted in each time slot (recited "the second weight-coefficient-multiplication unit has a weight W_2 which varies in accordance with the signal r_{rel} indicative of a reliability of the tentatively decided data" as the weighting coefficients have

different values for different symbols to be weighted in each time slot; column 12, lines 25 – 28). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miya et al. to include a method and means as claimed in claimed wherein the weighting coefficients have different values for different symbols to be weighted in each time slot such as that taught by Nakamura et al. in order to provide a demodulator which can improve a transmission-line estimate by using tentatively decided data symbols as pilot symbols, and, at the same time, avoids degradation in accuracy of the transmission-line estimate when error rate of the tentatively decided data symbols grows large (as suggested by Nakamura et al., see column 3, lines 21 – 26).

5. Claims 6, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miya et al. (US 6721367 B1), Moulsley (US 6470006 B1) and Nakamura et al (US 6442218 B1) as applied to claims 1, 2, 3, 9, 10, 11, 4, 12, 5, 13, 7, 15, 8, 16 above, and further in view of Shen et al. (US 6483884 B1).

Regarding claims 6, 14, Miya et al., Moulsley and Nakamura et al. do not disclose explicitly a method and means as claimed in claimed wherein the strength of the signal received at the base station is determined using RSSI (Received Signal Strength Indicator) measurement. Shen et al. disclose the limitation of explicitly a method and means as claimed in claimed wherein the strength of the signal received at the base station is determined using RSSI (Received Signal Strength Indicator) measurement (recited "are sequentially processed into received signal strength indicators $RSSI_0$ and $RSSI_1$ are stored " as the strength of the signal received at the base station is determined using RSSI (Received Signal Strength Indicator)

measurement; Fig. 1, column 3, lines 29 – 46). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miya et al., Moulsley and Nakamura et al. to include a method and means as claimed in claimed wherein the strength of the signal received at the base station is determined using RSSI (Received Signal Strength Indicator) measurement such as that taught by Shen et al. in order to designed to select the best antenna based on real and time delay quality indicators (as suggested by Shen et al., see column 1, lines 8 – 10).

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew C. Lee whose telephone number is (571) 272-3131. The examiner can normally be reached on Monday through Friday from 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ACL

June16, 2006

RICKY Q. NGO
SUPERVISORY PATENT EXAMINER